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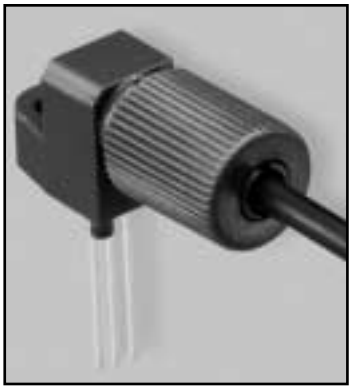
Plastic Fiber Optic Photologic Detectors IF-D95



Applications

- Digital Data Links
- PC-to-Peripheral Links
- Process Control
- Household Appliances
- Motor Controller Triggering
- Electronic Games
- Medical Instruments
- Automotive Electronics
- Robotics Communications
- EMC/EMI Signal Isolation

Description

The IF-D95T and IF-D95OC are high-sensitivity photologic detectors housed in a "connector-less" style plastic fiber optic package. The detector contains an IC with a photodiode, linear amplifier, and Schmitt trigger logic circuit. The IF-D95T features a TTL/CMOS compatible totem-pole output, while the IF-D95OC has an open-collector output. The devices can drive up to 5 TTL loads over supply voltages ranging from 4.5 to 16 Volts. Optical response extends from 400 to 1100 nm, making them compatible with a wide range of visible and near infrared LED and laser diode sources. The detector package features an internal micro-lens and a precision-molded PBT housing to ensure efficient optical coupling into standard 1000 µm core plastic fiber cable.

Application Highlights

The IF-D95T and IF-D95OC are suitable for digital data links at rates up to 125 kbps. A Schmitt trigger improves noise immunity and TTL/CMOS logic compatibility greatly simplifies interfacing with existing digital circuits. The integrated design of the IF-D95 provides a total, cost-effective solution in a variety of digital applications.

Features

- Integrated Photodetector, Amplifier and Schmitt Trigger
- Mates with Standard 1000 µm Core Jacketed Plastic Fiber Optic Cable
- No Optical Design Required
- Inexpensive But Rugged Plastic Connector Housing
- Internal Micro-Lens for Efficient Optical Coupling
- Connector-Less Fiber Termination
- Light-Tight Housing Provides Interference-Free Transmission
- High Optical Sensitivity
- *Active Low Output Option Available as Special Order*

Maximum Ratings

(T_A = 25°C)

Operating and Storage Temperature Range (T_{OP}, T_{STG}).....-40° to 85°C

Soldering Temperature (2 mm from case bottom) (T_S) t≤5s .....240°C

Supply Voltage, (V_S).....18 V

Voltage at Output lead (IF-95OC only) .....35 V

Sinking Current, DC (I_C) .....50 mA

Source Current (I_O) (IF-95T only) .....10 mA

Power Dissipation (P_{TOT}) T_A=25°C .....100 mW

De-rate Above 25°C .....1.33 mW/°C

Characteristics (T_A=25°C)

Parameter	Symbol	Min	Typ	Max	Unit
Peak Sensitivity	λ_{PEAK}	–	800	–	nm
Spectral Sensitivity (S=10% of S_{MAX})	$\Delta\lambda$	400	–	1100	nm
Operating Voltage	V_{CC}	–	–	16	V
Supply Current	I_{CC}	–	–	12	mA
Light Required to Trigger V_{CC}=5 V, R_L=1k, λ=660 nm	Er (+)	–	1.0 (-30)	–	µW(dBm)
IF-D95T					
High Level Output Voltage (I_{OH}= -1.0 µA)	V_{OH}	V_{CC}-2.1	–	–	V
Low Level Output Voltage (I_{OH}= 16 mA)	V_{OL}	–	–	0.34	V
Output Rise and Fall Times (f= 10.0 kHz, R_L= 10 TTL Loads)	t_r, t_f	–	–	70	ns
Propagation Delay, Low-High, High-Low (f= 10.0 kHz, R_L= 10 TTL Loads)	t_{PLH}, t_{PHL}	–	8.0	–	µs
IF-D95OC					
High Level Output Current (V_{OH}=30 V)	I_{OH}	100	–	–	µA
Low Level Output Voltage (I_{OL}=16 mA)	V_{OL}	–	–	0.4	V
Output Rise and Fall Times (f= 10.0 kHz, R_L=300Ω)	t_r, t_f	–	–	100	ns
Propagation Delay, Low-High, High-Low (f= 10.0 kHz, R_L=300Ω)	t_{PLH}, t_{PHL}	–	8.0	–	µs

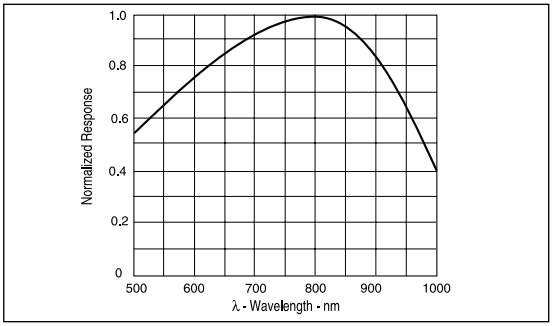


FIGURE 1. Typical detector response versus wavelength.

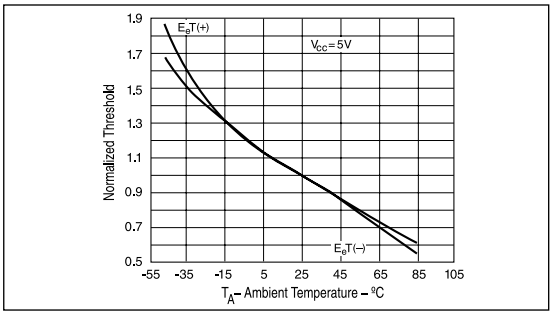


FIGURE 2. Normalized threshold irradiance vs. amb. temp.

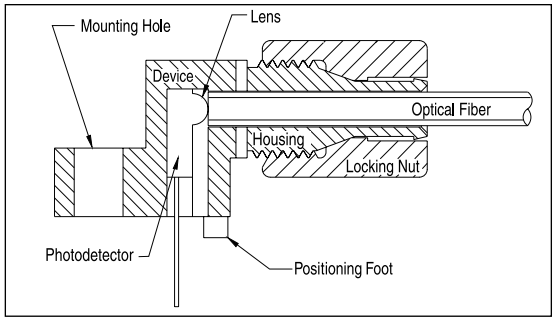
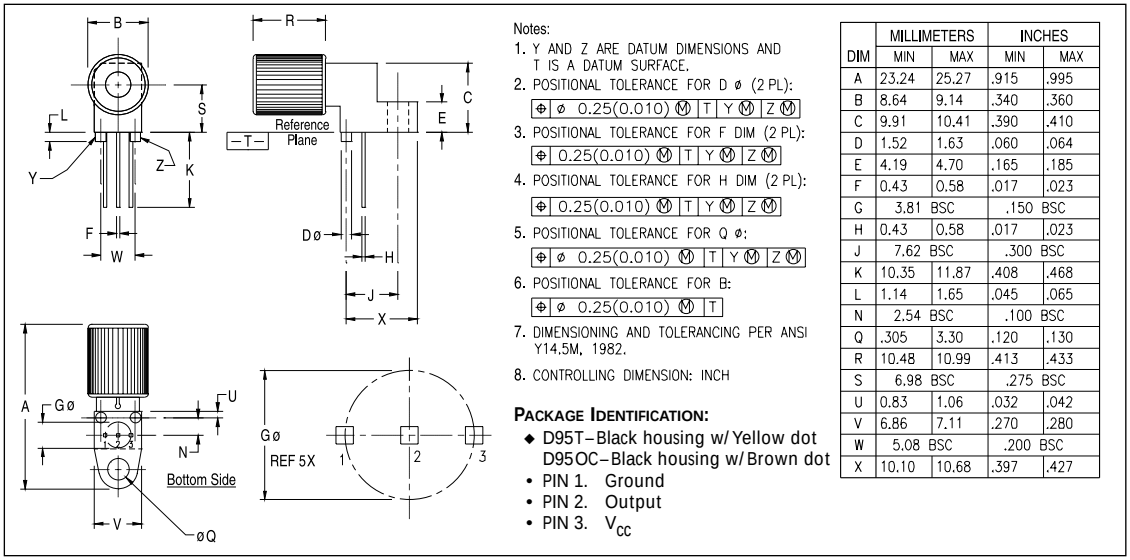


FIGURE 3. Cross-section of fiber optic device.

FIBER TERMINATION INSTRUCTIONS

1. Cut off the ends of the optical fiber with a single-edge razor blade or sharp knife. Try to obtain a precise 90-degree angle (square).
2. Insert the fiber through the locking nut and into the connector until the core tip seats against the internal micro-lens.
3. Screw the connector locking nut down to a snug fit, locking the fiber in place.



Notes:
1. Y AND Z ARE DATUM DIMENSIONS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR D ø (2 PL): ⌖ | ø 0.25(0.010) Ⓜ | T | Y Ⓜ | Z Ⓜ
3. POSITIONAL TOLERANCE FOR F DIM (2 PL): ⌖ | 0.25(0.010) Ⓜ | T | Y Ⓜ | Z Ⓜ
4. POSITIONAL TOLERANCE FOR H DIM (2 PL): ⌖ | 0.25(0.010) Ⓜ | T | Y Ⓜ | Z Ⓜ
5. POSITIONAL TOLERANCE FOR Q ø: ⌖ | ø 0.25(0.010) Ⓜ | T | Y Ⓜ | Z Ⓜ
6. POSITIONAL TOLERANCE FOR B: ⌖ | ø 0.25(0.010) Ⓜ | T
7. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
8. CONTROLLING DIMENSION: INCH

PACKAGE IDENTIFICATION:
- ◆ D95T–Black housing w/ Yellow dot
  D95OC–Black housing w/ Brown dot
- PIN 1. Ground
- PIN 2. Output
- PIN 3. V_{CC}

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	23.24	25.27	.915	.995
B	8.64	9.14	.340	.360
C	9.91	10.41	.390	.410
D	1.52	1.63	.060	.064
E	4.19	4.70	.165	.185
F	0.43	0.58	.017	.023
G	3.81 BSC		.150 BSC	
H	0.43	0.58	.017	.023
J	7.62 BSC		.300 BSC	
K	10.35	11.87	.408	.468
L	1.14	1.65	.045	.065
N	2.54 BSC		.100 BSC	
Q	.305	3.30	.120	.130
R	10.48	10.99	.413	.433
S	6.98 BSC		.275 BSC	
U	0.83	1.06	.032	.042
V	6.86	7.11	.270	.280
W	5.08 BSC		.200 BSC	
X	10.10	10.68	.397	.427

FIGURE 4. Case outline.